

Remarks

Applicants' remarks are directed to overcoming the parent case rejections as set forth in the Office Action of January 31, 2006. The Applicants request the Examiner to consider the claims in view of the amendments to the specification and claims, and the following Remarks.

Applicants have amended independent claim 1 by adding the limitation that the gel composition dissolves, not at the time of blending of the additive concentrate or lubricating oil, but rather over time during the operation of the engine when the composition is present in the lubricating system. The basis for this amendment is found in the specification, page 2, lines 24 to 29.

Applicants have added independent claim 25 which claims gel compositions represented by the formula $A+B+C$. The new claim defines distinct groups for each component, describing the nature of the gel that forms in the claimed compositions and the applications for which the gels are used. The basis for this new claim is found in the specification at page 4, lines 25-30 and page 5, lines 1-17, 25-31.

The Examiner previously rejected claims 1, 2 and 5-24 under 35 U.S.C. 102(b) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Higton et al (6,310,010). The Examiner is of the position that Higton, et al. meets the limitations of the claims when the dispersant, detergent and antioxidant combination in a package forms a gel. Further, the Examiner is of the position that, although reducing the emissions is not taught by Higton, et al., it is inherent because Higton, et al. teaches that gels are suitable for use in lubricants and gasoline and diesel engines. Applicants respectfully traverse.

Applicants amended claim 1 to include the limitation that the gel compositions dissolve into a lubricating oil, not at the time of the blending of any lubricating oil or additive concentrate, but rather over time during the operation of the engine. This controlled release is the advantage of the compositions, which result in the claimed benefits. Higton, et al. teaches at column 1, lines 23 to 30, that it is common practice to blend additive concentrates that are later used in preparation of finished lubricating oil compositions. Highton, et al. teaches at column 3, lines 2 to 7 that the invention disclosed has the objective of providing "a concentrated additive package composition" and "a process for preparing the additive package compositions". In short, Higton, et al. teaches the preparation of liquid additive packages used to prepare final lubricating oil compositions. In contrast, Applicants'

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invention relates to novel gel compositions that are used in engine lubricating systems, independent of the lubricating oil compositions. Applicants' gels are added to a lubricating system in order to release various components into the system over time. Therefore Applicants' invention is novel and unobvious over the Higton, et al. reference.

Furthermore, Higton, et al. teaches at column 1, lines 31 to 48 that the increasing viscosity of concentrate packages is a problem in its field that hampers the use of additive packages, specifically indicating that pumping, blending and general handling of the additive packages becomes more difficult as the viscosity of the packages increase. Higton, et al. further discloses at column 2, lines 38 through 40 that "the viscosity may rise uncontrollably to the extent that gels may form that are impossible to blend into a finished lubricating oil composition. The latter effect can evidence itself as Weisenberg Effect". This indicates that increases in the viscosity of the additive packages, well short of gelation, are serious problems the invention in Higton, et al. seeks to address. In contrast, Applicants' invention claims gel compositions, as amended in claim 1, that are specifically of a nature that they cannot be pumped, blended, or handled as additive concentrates, but are rather semi-solids that only dissolve into oil over time, and in some embodiments only partially dissolve, under conditions similar to those found in the lubricating system of an oil lubricating engine, as supported by the included declaration. As gels cannot be pumped, blended or handled as concentrates, due to the fact that they are solid-like materials with immeasurable viscosities, as opposed to liquid concentrates, they are not applicable to the uses described in Higton, et al. Therefore, Higton, et al. does not teach that gels are suitable for use as lubricants in gasoline and diesel engines but rather teaches that additive concentrates which cannot be pumped, blended, or handled as liquids, and which cannot be blended into final lubricating oil compositions, are not suitable for use as lubricants in gasoline and diesel engines.

Additionally, Higton, et al. teaches at column 3, lines 49 through 50 that "the inclusion of the surface active agent enables the viscosity of the concentrate to be controlled within manageable limits". Higton, et al. discloses a method for inhibiting the viscosity increases that make concentrate handling more difficult. The increases in viscosity that Higton, et al. seeks to avoid make the disclosed concentrate handling impossible to perform, well before the compositions actually form gels. In short, Higton, et al. uses surface active agents to minimize any increase of viscosity, especially increases large enough to lead to the formation of any gel, in liquid additive concentrates. In contrast, Applicant's claimed

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invention is directed to compositions that, by design, result in gels, and which are of such high and even immeasurable viscosities that they are unsuitable for use as concentrate additives as disclosed in Higton et al., as the gels cannot be pumped, blended or handled as conventional concentrates.

Moreover, Applicants' claims are directed to gel compositions only, any compositions containing surface active agents that result in liquid, non-gel, compositions, such as those disclosed in Higton, et al., are not included in Applicants' claims. Similarly, any compositions claimed by Applicants' that contain surface active agents, but that remain a gel, in a non-liquid state, are therefore not obvious nor anticipated by Higton et al..

Furthermore, Higton, et al. teaches at column 4, lines 46-57 that the composition "must be "oil-soluble" or "oil-dispersible" in the oleaginous carrier or oil" and while Higton, et al. adds that this does not mean all compositions are soluble, dissolvable or miscible, it does conclude that the compositions must be "stable and soluble in the oil to an extent sufficient to exert their intended effect". In short, Higton, et al. discloses liquid compositions that can be used as additive concentrates, in that they can be blended with oil, and possibly other components, to form finished lubricating oils. These compositions may thicken, to the point that using them in concentrates becomes difficult and even impossible, but that is the limit of the disclosure. In contrast, Applicants' invention is limited to semi-solid, gel compositions that are prepared independently from any lubricating oil package or concentrate and that are inserted into the lubricating system to work over time, improving the performance of the engine. Applicants' gel compositions provide improved engine performance that would not be possible with the use of final lubricating oils similar to those described in Higton, et al., as demonstrated in the examples. Thus, Applicants' invention, which claims gel compositions, as amended in claim 1, is neither suggested nor taught by Higton, et al. Accordingly, this rejection should be withdrawn.

In response to Examiner's position that Higton, et al. lists suitable ashless dispersants, at column 5, line 62 to column 11, line 22; suitable detergents, at column 11, lines 23-56; and allows for the addition of other components, at column 5, lines 8-17, Applicants point out that these descriptions correspond to components suitable for use in the invention described in Higton, et al., which is the preparation of liquid, low viscosity, concentrate packages which can be blended into final lubricating oil compositions. These descriptions of the components are not meant to describe components suitable for gel compositions and in fact are designed

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to avoid any increases in viscosity, let alone gelation, as much as possible. In contrast, Applicants' invention is directed only to gel compositions and the dispersants, detergents, antioxidants and other components suitable for use in compositions that lead to non-liquid, gels with immeasurable viscosities.

In reference to Example 1, column 17 in Higton, et al. and Table I in column 18, Examiner notes that the Weissenberg Effect was observed in several compositions described. Applicants point out that the Weissenberg effect describes the increase in viscosity that the invention in Higton, et al. attempts to minimize and, as demonstrated by the data presented in Higton, et al., only leads to gelation in extreme cases. Table 1 lists compositions with viscosities at 100°C that range from 1497 cSt to 30,832 cSt and one control composition with a viscosity of >100,000. This control is the only item listed that could even possibly be referred to as a gel as the other compositions listed have viscosities, that while increasing, do not approach the point that they would be considered a non-liquid, solid-like, gel material, as supported by the included declaration. Applicants also note that the control shown in the table does not represent the invention of Higton, et al., and is in fact included to show how some compositions, without the disclosed invention's benefit, would be completely useless for the purposes of the Higton, et al. reference. In contrast, Applicants' invention, directed to gels, claims compositions that by their very nature do not have measurable viscosities, as they are solid-like gels and not liquids at all. Therefore, the examples in Higton, et al. demonstrate that only liquid concentrates are disclosed and that concentrates with increasing viscosities presents issues that can only be mitigated to a limited extent. There is no indication in the reference that gels, semi-solid materials that cannot be pumped, blended or handled like conventional concentrates, are usable or of any value. Thus, Applicants' invention, which claims gel compositions, as amended in claim 1, is neither suggested nor taught by Higton, et al. Accordingly, this rejection should be withdrawn.

Furthermore, claims 11 through 22, directed at processes utilizing gel compositions and not gel compositions themselves, are neither taught by nor obvious from the Higton, et al. reference. The processes in claims 11 through 22 relate to processes of contacting a portion of the engine oil with a gel, resulting in the reduction of soot in the engine oil and/or emission in an engine exhaust. In contrast, Higton, et al. lists no uses for gels, but rather only for liquid concentrates with relatively low viscosities. Accordingly, Claims 11 through 22 should be allowable over the Higton, et al.

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If the Examiner maintains the position that the gel compositions in Applicants' claims are covered by the liquid compositions disclosed in Higton, et al., with which the Applicants strongly disagree, the processes claimed by Applicants are directed to uses and applications of the gel compositions not claimed nor disclosed in Higton, et al.. Indeed, Applicants' claimed processes cannot be attempted using the compositions disclosed in Higton, et al. as they are not semi-solid gels that would dissolve over time, but are rather liquid concentrates that would flow and disperse readily into the lubricating oil of a lubricating oil engine over a relatively short period of time. The semi-solid nature of the gel compositions is what allows Applicants' compositions to remain intact while in contact with the lubricating oil of a lubricating oil engine over long periods of time while the engine is operating, and allows the gel dissolve into the oil in a controlled manner. Therefore, the processes claimed by Applicants, describing a means for reducing emissions, reducing soot in an engine and combinations thereof, cannot be inherent under Higton, et al. as the reference is limited to using liquid concentrate compositions to improve the preparation of lubricating oil compositions, and could not be utilized in the processes claimed by Applicants. Accordingly, Claims 11 through 22 should be allowable over the Higton, et al. reference.

New claim 25 claims a semi-solid gel composition made of three components, A+B+C, where component C is not the surface-active agent of Higton, et al., but is instead one selected from a group of components that are not identical nor taught by the reference. The added limitation that component C be selected from a list consisting essentially of a limited number of components excludes the surface-active agent of the reference. Accordingly, claim 25 should be allowable over the Higton, et al. reference.

For the reasons set forth above, Applicants' present invention as claimed is novel and not obvious over the reference. Applicants respectfully request the Examiner to remove the 35 USC 103(a) and 102(b) rejections and find all claims allowable.

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If any fees are due, the Commissioner is authorized to charge such fee to The Lubrizol Corporation Deposit Account No. 12-2275. A duplicate copy of this document is submitted for such purposes.

Respectfully submitted,

THE LUBRIZOL CORPORATION

A handwritten signature in black ink, appearing to read "Teresan W. Gilbert", written over the printed name.

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